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# Mosses of Bermuda

Elizabeth G. Britton

(with plates 6 and 7)

There has been no list of the mosses of Bermuda published since 1885,* when William Mitten studied the collections made by the Challenger Expedition and enumerated five genera and eight species, of which two were described as new. One of these, *Trichostomum bermudanum* Mitt., has proved to be endemic and two others, *Tortula melanocarpa* Mitt. and *Isopterygium tenerum* Mitt., have been referred to older names. No localities were recorded.

A taxonomic study of the flora of Bermuda was undertaken by the New York Botanical Garden in 1905† in cooperation with the Academy of Natural Sciences of Philadelphia, and several visits have been made by Mr. Stewardson Brown and Dr. and Mrs. N. L. Britton at various times of the year in pursuit of this investigation. These have yielded twenty genera and twenty-eight species of mosses and added another endemic species, *Campylopus bermudianus*. It will thus be seen that the island is not rich in mosses and the most widely distributed species is *Trichostomum bermudanum* which occurs rather commonly on stone walls and limestone rocks, particularly in shady moist places. A few of the rarer species are likely to become extinct with the clearing, burning and cultivation of the marshes, notably the species of *Sphagnum*, *Campylopus*, *Syrrhopodon* and *Isopterygium;* a few others are only to be found in a few deep dark crevices and caves in the parish of Hamilton. Besides the two endemic species, there are eight cosmopolitan ones belonging to the five genera *Bryum*, *Eucladium*, *Funaria*, *Hymenostylium*, and

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* Voyage of H. M. S. Challenger, pp. 89–92. 1885.

† Bermuda in September, Jour. N. Y. Bot Gard. **6**: 153–158. 1905; Botanical Exploration in Bermuda, Jour. N. Y. Bot. Gard. **13**: 189–194. 1912; Gardens of Bermuda, Jour. N. Y. Bot. Gard. **14**: 172. 1913; Jour. N. Y. Bot. Gard. **15**: 148. 1914.

*Weisia;* six having a wide range in temperate North America, Europe and Asia, belonging to the genera *Amblystegium, Anomodon, Isopterygium, Leucobryum,* and *Sphagnum;* and ten species of subtropical or tropical distribution: most of these are not known to occur except in America and represent the eight genera *Cyclodictyon, Fissidens, Gyroweisia, Rhacopilum, Sematophyllum, Syrrhopodon, Thuidium,* and *Tortula.*

Dr. Evans has listed* twenty genera and twenty-two species of the Hepaticae and has since reported two species of *Anthoceros,*† thus bringing the total number of bryophytes to forty-one genera and fifty-two species, the number being almost equally divided between hepatics and mosses. None of the Hepaticae are endemic.

In the following enumeration, unless otherwise stated, the specimens cited by number were collected by Mr. Stewardson Brown or Dr. and Mrs. N. L. Britton; a few were collected by Dr. M. A. Howe in July, 1900.

1. SPHAGNUM MAGELLANICUM Brid.

*Sphagnum medium* Limpr. Not *Sphagnum cymbifolium* Ehrh., as listed by the Challenger Expedition.

Devonshire Marsh, *M. A. Howe.*

2. SPHAGNUM CUSPIDATUM SERRATUM Schliep.

*Sphagnum trinitense* C. Müll.

Devonshire Marsh, *M. A. Howe;* Pembroke Marsh, *340, 417.*

3. CAMPYLOPUS BERMUDIANUS R. S. Williams.

On damp ground in shade of palmetto, Paget Marsh, *651, 1138, 1872.*

4. LEUCOBRYUM GLAUCUM (L.) Schimp.

Devonshire Marsh, *M. A. Howe 376;* Paget Marsh, on the ground under shade of palmetto, *1860.*

5. FISSIDENS GARBERI Lesq. & James.

On rocks near Harrington House, *548a;* gully, Abbot's Cliff, *893, 951, 1859.*

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* Bull. Torrey Club **33**: 129–135. *pl. 6.* 1906.

† Brylogist **13**: 36. 1910; **16**: 55. 1913.

6. FISSIDENS MINUTULUS Sull.

Calcareous rocks, gully near Tuckerstown, *322;* on stones in shade, Church Cave; also on Abbot's Cliff, mixed with *893* and *951.*

7. FISSIDENS TAXIFOLIUS (L.) Hedw.

On the ground in woods near Walsingham Caves, *M. A. Howe,* also *284.*

8. SYRRHOPODON FLORIDANUS Sull. (PLATE 6.)

On base of palmetto in dense mats, sterile; propagating by gemmae from the tips of the leaves. Devonshire Marsh, *M.A. Howe;* Paget Marsh *233, 655, 656, 1856.*

9. WEISIA VIRIDULA (L.) Hedw.

Castle Harbor, Walsingham, *430a.*

10. WEISIA LONGISETA Lesq. & James.

Near Harrington House, *432;* on rocks, Walsingham, *485;* near Tuckerstown, *501.*

11. GYROWEISIA BARBULA (Schwaegr.) Par.

*Tortula melanocarpa* Mitt. (Challenger Report.)

On rocks near Tuckerstown, *502;* roadside rocks near Paynter's Vale, *517;* also near Harrington House, *549.*

12. EUCLADIUM VERTICILLATUM (L.) Br. & Sch.

*Tortula verticillata* Mitt. (Challenger Report.)

Wet limestone rocks, Smuggler's Cave, *M. A. Howe;* Church Cave, *271;* walls of Cooper's Hole, Paynter's Vale.

13. HYMENOSTYLIUM CURVIROSTRE (Ehrh.) Lindb.

Under dripping limestone rocks forming calcareous tufa, Church Cave; Walsingham Cave, *1193.*

14. TRICHOSTOMUM BERMUDANUM Mitt.

"In extensive patches on calcareous sand" without locality, Challenger Expedition; on stone wall, Hamilton, *M. A. Howe;* rocks, north shore, *62;* Devonshire Marsh, *97;* rocks and stone walls near Harrington House, *442a, 833;* Paget Sand Hills, *620;* on the ground, Paynter's Vale, *805, 808;* Hall's Island, Harrington Sound, *894;* Abbot's Cliff, *926;* St. David's Island, *1064, 2082;* Montrose, *2214.*

15. TORTULA AGRARIA (Sw.) Sw.

On calcareous rocks near Paynter's Vale, *466;* also near Harrington House, *548.*

16. FUNARIA HYGROMETRICA (L.) Sibth.

On rocks near Harrington House, *551.*

17. FUNARIA FLAVICANS Michx.

Without definite station, *Mrs. W. E. Damon,* 1888.

18. BRYUM DICHOTOMUM Hedw.

Without definite station, Challenger Expedition.

19. BRYUM CAPILLARE L.

Fruiting plants were collected on rocks near Paynter's Vale, *465;* sterile specimens, propagating by gemmae, were found in Paget Marsh, *227;* gully in Abbot's Cliff, *928;* on the side of a cistern, the Flats, *A. B. Hervey,* 1913.

20. BRYUM CRUEGERI Hampe.

Sterile specimens, on stones, Devonshire Marsh, *160.*

21. CYCLODICTYON VARIANS (Sull.) Broth.

On damp rocks in shade, Walsingham Cave, *283;* Church Cave, *801, 1089.*

22. RHACOPILUM TOMENTOSUM (Sw.) Brid. (PLATE 7.)

Without definite station, Challenger Expedition; shaded rocks, fruiting, gully and cave, Paynter's Vale, *326;* Church Cave, *503, 507, 510, 1091;* Gully near Tuckerstown, *515;* Abbot's Cliff, *892, 1857.*

23. ANOMODON ROSTRATUS (Hedw.) Schimp.

A lax sterile form of this species has been found on shaded rocks at a cave near Harrington House, *558,* at Paynter's Vale, *806,* and on Abbot's Cliff, *1877.*

24. HAPLOCLADIUM MICROPHYLLUM (Sw.) Broth.

On shaded rocks, Abbot's Cliff, *890, 925, 926;* Church Cave, *1092.*

25. THUIDIUM MINUTULUM (Hedw.) Br. & Sch.

In gully, Paynter's Vale, *361.*

26. AMBLYSTEGIUM VARIUM (Hedw.) Lindb.

Damp rocks, Church Cave, fruiting, *509*, *804*, *1093;* shaded rocks, Paynter's Vale, *806* in part.

27. ISOPTERYGIUM MICANS (Sw.) Mitt.

*Isopterygium tenerum* Mitt. (Challenger Report.)

On root-stocks of *Osmunda cinnamomea*, and on old stumps, Devonshire Marsh, *44*, *568*, *809*, *812;* at base of palmetto, Paget Marsh, *647*, *1855;* Pembroke Marsh, *626;* Warwick Marsh, *623*.

28. SEMATOPHYLLUM ADNATUM (Michx.) E. G. Britton.

On cedar tree, Walsingham Cave, *282;* on rotten wood, near cave, Paynter's Vale, *1117*.

## Explanation of plates 6, 7

PLATE 6. SYRRHOPODON FLORIDANUS Sull.

Drawings made with a magnification twice the diameter reproduced on the plate.

FIG. 1. Plant, natural size.

FIG. 2. Plant enlarged.

FIG. 3. Cross section of stem, ×120.

FIGS. 4–7. Leaves, ×18½.

FIG. 8. A portion of base of leaf showing curve, ×87½.

FIG. 9. Apex of leaf showing end of costa, ×120.

FIG. 10. The large hyaline cells of basilar portion of leaf, ×500.

FIG. 11. Cells of the basilar and median portions of leaf taken from the upper edge of the hyaline group, represented in Figs. 4, 5, and 7, by dotted lines, ×500.

FIG. 12. Marginal cells, ×500.

FIGS. 13, 14. Median cells, ×500.

FIG. 15, Portion of ventral surface of leaf from costa to margin, ×210.

FIG. 16. Surface view of double margin from median portion of leaf, ×120.

FIGS. 17, 18, 19. Cross sections of double margin, 17, 18, ×270; 19×210.

FIG. 20. Surface view of lower portion of costa, ×120.

FIG. 21. Surface view of upper portion of costa showing papillae, ×120.

FIG. 22. Cross section of lower portion of leaf, ×120.

FIG. 23. Portion of same with higher magnification, ×210.

FIG. 24. Cross section of upper portion of leaf, ×210.

FIGS. 25, 26. Cross sections of costa showing papillae on costa and the cells of the upper portion of leaf, ×210.

FIG. 27. Apex of leaf with gemmae and filaments arising from both the dorsal and ventral surface of costa tip, ×87½.

FIG. 28. Filaments arising from cells of the costa in median portion, ×120.

FIG. 29. Filament arising from a cell of the basilar portion of costa, ×87½.

FIG. 30. Filaments arising from median cells near double margin, ×87½.

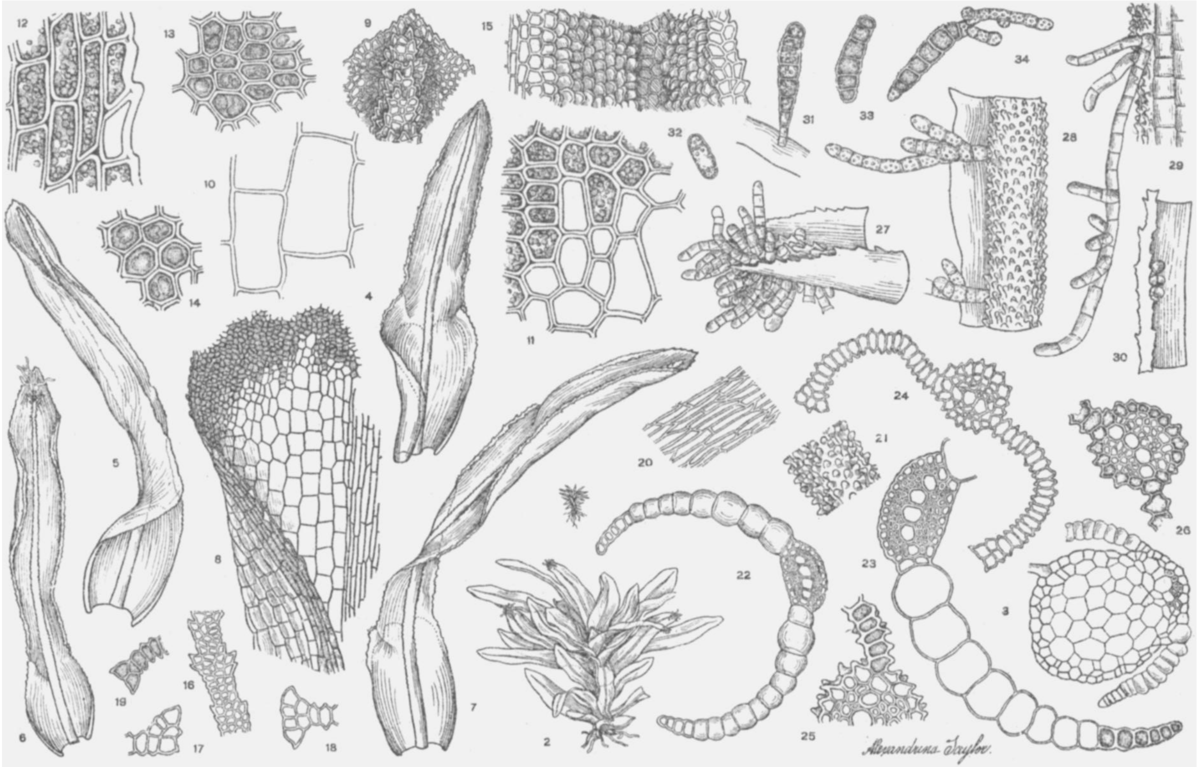
FIG. 31. Gemma arising from a median cell, ×87½.

FIGS. 32–34. Gemmae, ×87½.

### PLATE 7. RHACOPILUM TOMENTOSUM (Sw.) Brid.

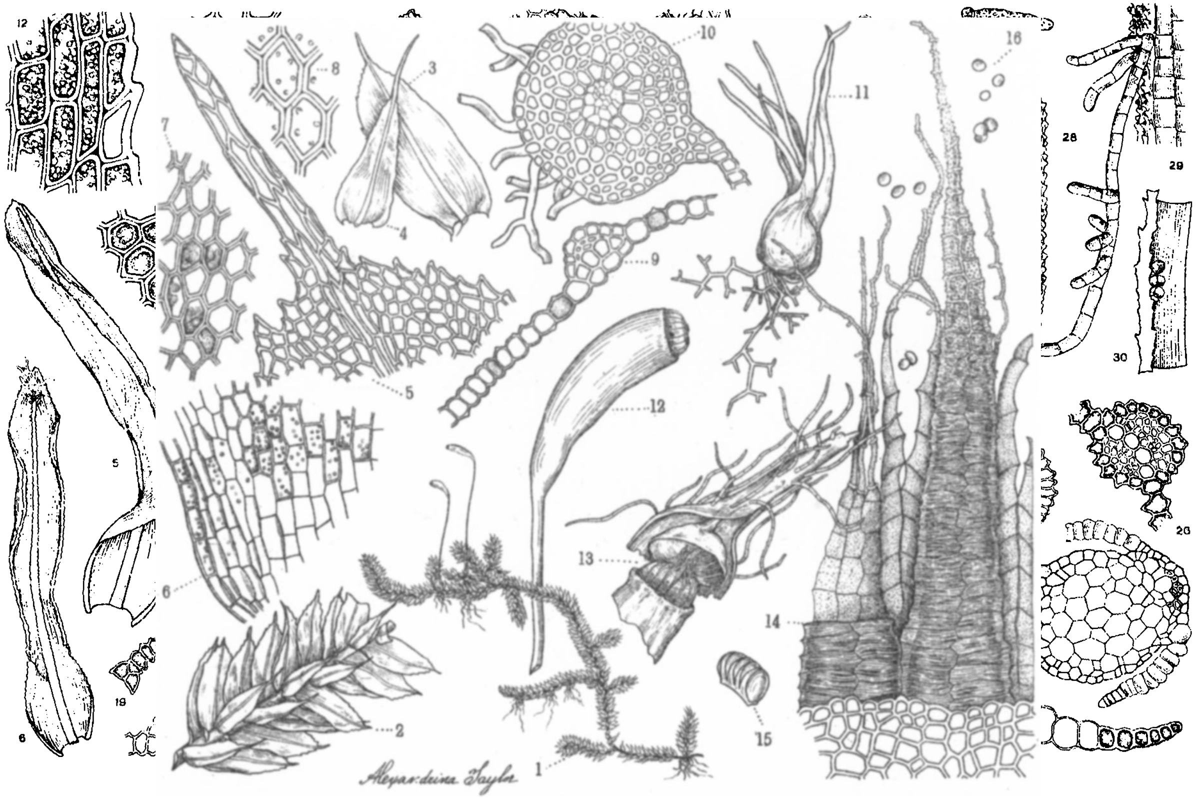
The figures were drawn with a magnification three times greater than that indicated and the resulting figures were reduced to one third.

Fig. 1. Plant, natural size.
Fig. 2. Branch showing arrangement of large and small leaves, ×6⅔.
Fig. 3. Large leaf, ×12⅓.
Fig. 4. Small leaf, ×12⅓.
Fig. 5. Apex of large leaf showing excurrent costa, ×80.
Fig. 6. Basal cells of large leaf, ×80.
Fig. 7. Median cells of large leaf, ×195.
Fig. 8. Surface view showing papillae, ×333⅓.
Fig. 9. Cross section of leaf, ×138⅓.
Fig. 10. Cross section of stem, ×80.
Fig. 11. Perichaetial bud, ×19⅔.
Fig. 12. Capsule, ×4⅔.
Fig. 13. Portion of capsule with lid and calyptra, ×10.
Fig. 14. Peristome, ×80.
Fig. 15. Annulus, ×80.
Fig. 16. Spores, ×80.



SYRRHOPODON FLORIDANUS SULL.

HELIOTYPE CO., BOSTON.



SYRRHOPODON FLORIDANUS SULL.

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